

## CLAIMS

What is Claimed is:

1        1. A low-VOC (volatile organic compound) and/or low-toxicity coating formulation,  
2        comprising:  
3            at least one non-halogenated solvent including terpene(s) or terpenoid(s);  
4            at least one polymer comprising one of conducting polymer(s), conjugated  
5        polymer(s), or electroactive polymer(s), wherein said non-halogenated solvent(s)  
6        and said polymer(s) are in non-aqueous form.

1        2. The coating formulation according to claim 1, further comprising at least one of  
2        copolymer, block polymer, and mixtures thereof.

1        3. The coating formulation according to claim 1, wherein said terpene or terpenoid  
2        comprises at least one of dipentene (d-limonene),  $\alpha$ -pinene,  $\beta$ -mircene, p-cimene,  
3        citronellolio, geraniale (citrale), nerol, beta-carotene, menthol, geraniol, farnesol,  
4        phytol, their homologs, derivative, enantiomers, isomers including constitutional  
5        isomers, stereoisomerisms, regioisomers, and geometric isomers, and any  
6        combination thereof.

1        4. The coating formulation according to claim 1, wherein said polymers comprises at  
2        least one of polydialkylaminophenylene vinylene including poly [bis (N-methyl-N-  
3        hexylamino)phenylenediamine (BAMPPV) and polydialkyloxyphenylenevinylene

including poly[2-methoxy-5-(2'-ethylhexyloxy)-1,4-phenylenevinylene]  
(MEHPPV).

5. The coating formulation according to claim 1, wherein said polymers comprises at least one of polyphenylene vinylenes, polythiophenes, polypyrroles, polyanilines, polyacetates, polyacetylenes, polyacrylates, polyazene, polystyrene, poly-N-vinylcarbazole, polyvinylpyridine, polyindole, copolymer, block polymer, and any combination thereof.

6. The coating formulation according to claim 1, further comprising at least one of surfactant(s), solvent(s), and organic components.

7. The coating formulation according to claim 1, wherein said polymers are in neutral, oxidized or reduced form, in the form of a salt including an emeraldine salt, or in any basic or acidic form.

8. The coating formulation according to claim 1, wherein said solvent and said polymer formulation(s) are in said non-aqueous form comprising a solution, mixture, suspension, or emulsion.

9. The coating formulation according to claim 1, wherein said coating formulation is applied to a substrate including spray coating, dip coating, spin-coating, flow-coating, doctor blade coating, or screen-printing.

1 10. The coating formulation according to claim 1, wherein said coating formulation is  
2 incorporated into a coating or resin comprising at least one of epoxies,  
3 polyurethanes, polyamides, polyimides, polysulfides, polysiloxanes, polyvinyls,  
4 polyphenolics, polyxylenes, polyacrylics and polyesters.

1 11. The coating formulation according to claim 10, wherein said coating and resin is  
2 organic or inorganic.

1 12. A low-VOC (volatile organic compound) and/or low-toxicity coating formulation,  
2 comprising: /  
3 about 0.01 % wt. to about 99.9 % wt. of at least one non-halogenated solvent  
4 including terpene(s) or terpenoid(s);  
5 about 0.01 % wt. to about 90 % wt. of at least one polymer comprising of  
6 conducting polymer(s), conjugated polymer(s), or electroactive polymer(s); and  
7 about 0.001 % wt to about 90 % wt. of at least one surfactant, wherein said  
8 non-halogenated solvent(s), said polymer(s), and said surfactant(s) are in non-aqueous  
9 form..

1 13. The coating formulation according to claim 12, further comprising at least one of  
2 copolymer, block polymer, and mixtures thereof.

1 14. The coating formulation according to claim 12, wherein said terpene or terpenoid  
2 comprises at least one of dipentene (d-limonene),  $\alpha$ -pinene,  $\beta$ -mircene, p-cimene,

3 citronellolio, geraniale (citrale), nerol, beta-carotene, menthol, geraniol, farnesol,  
4 phytol, their homologs, derivative, enantiomers, isomers including constitutional  
5 isomers, stereoisomerisms, regioisomers, and geometric isomers, and any  
6 combination thereof.

1 15. The coating formulation according to claim 12, wherein said polymers comprises at  
2 least one of polydialkylaminophenylenevinylene including poly [bis (N-methyl-N-  
3 hexylamino)phenylenediamine (BAMPPV) and polydialkyloxyphenylenevinylene  
4 including poly[2-methoxy-5-(2'-ethylhexyloxy)-1,4-phenylenevinylene]  
5 (MEHPPV).

1 16. The coating formulation according to claim 12, wherein said polymers comprises at  
2 least one of polyphenylene vinylenes, polythiophenes, polypyrroles, polyanilines,  
3 polyacetates, polyacetylenes, polyacrylates, polyazene, polystyrene, poly-N-  
4 vinylcarbazole, polyvinylpyridine, polyindole, copolymer, block polymer, and any  
5 combination thereof.

1 17. The coating formulation according to claim 12, further comprising other organic  
2 components.

1 18. The coating formulation according to claim 12, wherein said polymers are in neutral,  
2 oxidized or reduced form, in the form of a salt including an emeraldine salt, or in  
3 any basic or acidic form.

- 1        19. The coating formulation according to claim 12, wherein said solvent and said  
2                polymer formulation(s) are in said non-aqueous form comprising a solution,  
3                mixture, suspension, or emulsion.
- 1        20. The coating formulation according to claim 12, wherein said coating formulation is  
2                applied to a substrate including spray coating, dip coating, spin-coating, flow-  
3                coating, doctor blade coating, or screen-printing.
- 1        21. The coating formulation according to claim 12, wherein said coating formulation is  
2                incorporated into a coating or resin comprising at least one of epoxies,  
3                polyurethanes, polyamides, polyimides, polysulfides, polysiloxanes, polyvinyls,  
4                polyphenolics, polyxylenes, polyacrylics and polyesters.
- 1        22. The coating formulation according to claim 21, wherein said coating and resin is  
2                organic or inorganic.
- 1        23. Aqueous low-VOC (volatile organic compound) and/or low-toxicity coating  
2                formulation, comprising:  
3                        at least one non-halogenated organic solvent including terpene(s) or terpenoid(s);  
4                        at least one and at least one conjugated, electroactive, or conductive polymer,  
5                copolymer, block polymer, and mixtures thereof.

- 1        24. The coating formulation according to claim 23, wherein said coating formulation is  
2        incorporated into a coating or resin comprising at least one of epoxies,  
3        polyurethanes, polyamides, polyimides, polysulfides, polysiloxanes, polyvinyls,  
4        polyphenolics, polyxylenes, polyacrylics and polyesters.